



## National Transportation Safety Board Aviation Accident Preliminary Report

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<b>Location:</b>	Suffolk, VA	<b>Accident Number:</b>	ERA20LA080
<b>Date &amp; Time:</b>	12/24/2019, 1415 EST	<b>Registration:</b>	N230BW
<b>Aircraft:</b>	TEAM ROCKET F-1 F-1	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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On December 24, 2019, about 1415 eastern standard time, an experimental, amateur-built F-1 Rocket, N230BW, was substantially damaged while maneuvering near Suffolk, Virginia. The airline transport pilot (ATP) and a private pilot were not injured. The airplane was registered to and operated by the ATP pilot under the provisions of Title 14 *Code of Federal Regulations* as a Part 91 personal flight. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight that departed Suffolk Executive Airport (SFQ) Suffolk, Virginia about 1345.

The ATP pilot was operating the airplane from the front seat; he reported that after they performed several touch and go landings at SFQ, they flew southeast of the airport for light, "gentleman's aerobatics." They conducted several aileron rolls, barrel rolls, and wing overs at airspeeds between 150 and 180 knots, and no more than 3 G's which was below the airplane limit of 6 G's. Additionally, he stated that momentary speeds of 225 knots were witnessed during two nose-high pulls into wing overs. At the conclusion of the sequence, the private pilot in the rear seat executed two aileron rolls, followed by a barrel roll. The maneuver was entered about 3,000 ft mean sea level (msl) at 165 knots and the airplane climbed to about 4,000 ft msl. The rear seated pilot initiated a 25° nose down pitch and as the airspeed increased above 180 knots, he pulled back on the stick to recover from the descent. During the recovery, a loud noise was heard, and a buffet was felt. All engine parameters appeared normal, but a "flutter" was felt in the airframe. About 5 seconds later, the airplane experienced a negative G nose over and both pilots hit their heads on the canopy.

The front seat pilot took control of the airplane, reduced engine power to idle, and recovered. Pitch authority was difficult to maintain during the flight to Virginia Hampton Roads Executive Airport (PVG), Norfolk, Virginia. During the first landing attempt, the airplane bounced several times. The pilot initiated a go-around and attempted another landing which was successful.

The airplane was equipped with a Dynon Avionics (D-180) multi-function display unit, which was recovered and downloaded. Review of preliminary flight data revealed that during the maneuver which preceded the structural failure, the airplane was flying about 3,000 ft msl at a negative 25° pitch that progressed to a negative 38° pitch at 1,800 ft msl while descending

about 11,000 feet per minute (fpm). The airspeed increased from 230 to 244 knots, exceeding Vne (never exceed speed) of 240 knots. The recorded G range during this period was -2.31 to +3.68. The pilot recovered at 455 ft msl and initiated a positive rate of climb. About 5 seconds after initiation of the climb, there was a momentary pitch down and subsequent negative G indication of -0.125, before the climb was reestablished.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed that the right horizontal stabilizer separated from the airplane and the right elevator remained attached but was bent downward. The left horizontal stabilizer and elevator remained attached, but were bent downward. There were buckles near the elevator spar connections and several tears in the spar.

The front seat pilot held an airline transport pilot certificate with ratings for airplane single engine land and multi-engine land instrument airplane. In addition, he held a flight instructor certificate with ratings for airplane single engine land, airplane multi-engine land, and instrument airplane. He was issued an FAA first class-class medical certificate on March 19, 2019. He reported 2,738 hours total flight time, of which 4 hours were in the accident airplane make and model.

The rear seat pilot held a private pilot certificate with a rating for airplane single engine land. He was operating under Basic Med and reported 45 hours total flight time.

According to FAA records, the airplane was issued an experimental amateur-built airworthiness certificate on December 12, 2009. It was a tandem, two-place, internally braced low-wing airplane, that was equipped with tailwheel landing gear, and a Lycoming IO-540, 250-horsepower engine driving a three-blade MT constant speed propeller. The airplane and engine had accumulated 407 hours total time and 6 hours since its most recent annual inspection on November 2, 2019.

The reported weather conditions at PVG, about 10-miles north of the accident location, at 1356 included wind from 060° at 10 knots, gusting to 18 knots, visibility 10 statute miles and clear, temperature 11° C, dew point 03° C, and an altimeter setting of 30.04 inches of mercury.

#### Aircraft and Owner/Operator Information

Aircraft Make:	TEAM ROCKET F-1	Registration:	N230BW
Model/Series:	F-1	Aircraft Category:	Airplane
Amateur Built:	Yes		
Operator:	On file	Operating Certificate(s) Held:	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	PVG, 28 ft msl	Observation Time:	1356 EST
Distance from Accident Site:	10 Nautical Miles	Temperature/Dew Point:	11° C / 3° C
Lowest Cloud Condition:		Wind Speed/Gusts, Direction:	10 knots / 18 knots, 60°
Lowest Ceiling:		Visibility:	10 Miles
Altimeter Setting:	30.04 inches Hg	Type of Flight Plan Filed:	None
Departure Point:	Suffolk, VA (SFQ)	Destination:	Norfolk, VA (PVG)

## Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	36.649722, -76.512500

## Administrative Information

Investigator In Charge (IIC):	Lawrence A Mccarter
Additional Participating Persons:	Ken Bain; FAA FSDO; Richmond, VA
Note:	The NTSB did not travel to the scene of this accident.